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CARDIOLOGY - I

ANTENATAL DIAGNOSIS OF CONGENITAL HEART DISEASE - IMPACT ON POSTNATAL MANAGEMENT AND SURVIVAL

*Shanthi Chidambarathanu

Abstract: *Fetal echocardiography has increased the detection of congenital heart diseases. Delivery planning, prognostication of diseases and detection of genetic anomalies have improved; better neonatal presentation and reduced early neonatal mortality have been shown in critical congenital heart disease. Though overall survival benefit is yet to be proven, increased survival in d-TGA has been proven by various studies. As the diagnosis of non-critical lesions might not make a significant impact and many non-medical factors may influence the postnatal outcome in under-developed nations, actual impact of fetal diagnosis can be understood only if studied under disease specific category with inclusion of socio-economical and health-care variables.*

Keywords: *Fetal echocardiography, Antenatal diagnosis, Congenital heart diseases, Outcome.*

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Points to Remember

- ***Data on postnatal outcome of fetal cardiac diagnosis is skewed by higher termination rate, socio-cultural status, diverse health care standards and economic burden of developing world.***
- ***Reduced early neonatal mortality and improved short-term outcome are shown in critical lesions especially in d-TGA.***
- ***Overall survival benefit has not been proven by many advanced centres worldwide***
- ***Actual benefit of prenatal diagnosis in developing countries may be known only after studying and strengthening the current perinatal care system.***

Acknowledgement: I wish to acknowledge all the fetal cardiac units from where I have gained knowledge by personal experience or by their publications which could not be stated here due to limitations.

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CARDIOLOGY - I

NEWBORN WITH CONGENITAL HEART DISEASE - CLUES TO DIAGNOSIS, DO'S AND DONT'S

***Srinivas Lakshmivenkateshiah**

Abstract: *Congenital heart defects are diagnosed in approximately 1% of all live births and account for the largest proportion of infant mortality attributable to birth defects. Approximately 70% of infant deaths attributable to congenital heart defects occur in the newborn period. Clinical recognition of a critical CHD from various non cardiac illness like respiratory distress, sepsis and shock are often challenging and needs high index of suspicion. A meticulous echocardiogram can guide a clinician with proper anatomical diagnosis of CHD and provide functional assessment of cardiac function in a sick neonate. We discuss a few common newborn clinical scenarios, clues to CHD diagnosis and their differential diagnosis in difficult situations.*

Keywords: *Congenital heart disease, Newborn, Pulmonary hypertension, Missed diagnosis.*

Points to Remember

- ***Most common critical congenital heart disease present during the newborn period.***
- ***Critical congenital heart diseases are important cause of neonatal and infant mortality.***
- ***Understanding and insight into cardiovascular hemodynamics help clinician to suspect and manage such neonates successfully.***
- ***Certain clinical clues are evident and looked for to pick up commonly missed congenital cardiac lesions.***

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CARDIOLOGY - I

APPROACH TO A CHILD WITH CARDIAC MURMUR

*Ritchie Sharon Solomon J

Abstract: *Murmurs are categorized by their timing within the cardiac cycle. Accurate identification of innocent murmur in a healthy and asymptomatic child may obviate the need for further investigations. Appropriate usage of clinical and diagnostic tools will help us to differentiate innocent/ functional murmur from pathological murmur. In this review, the classification of murmurs, functional murmurs and a diagnostic approach to cardiac murmurs in pediatric age group are discussed.*

Keywords: *Cardiac murmur, Infant, Child, Innocent murmur.*

Points to Remember

- ***Cardiac murmurs are quite common in healthy infants and children.***
- ***Most cardiac murmurs in pediatric age group are innocent murmurs, but it also may be the only manifestation of a serious heart disease.***
- ***Clinical diagnosis of pathological murmur warrants early pediatric cardiology referral.***
- ***Threshold for pediatric cardiology referral should be low for infants with murmur.***
- ***Systematic approach guides the clinician for an accurate diagnosis.***

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CARDIOLOGY - I

CYANOTIC CONGENITAL HEART DISEASE - DIAGNOSIS AND MANAGEMENT

***Sakshi Sachdeva**

Abstract: *Cyanosis is a clinical sign referring to bluish discoloration of skin, nails and mucosa. It can be central cyanosis or peripheral cyanosis depending on presence or absence of mucosal involvement. Central cyanosis can have many etiologies ranging from cardiac, pulmonary, hematologic or neurologic causes. Clinical history, physical examination and specific investigations help us to make a tentative diagnosis first. Causes for cyanosis differs across different age groups. In cardiac causes of cyanosis one should make a thorough clinical examination followed by electrocardiogram and chest radiograph even before embarking upon echocardiogram. Oxygen saturation should be measured in both pre-ductal and post-ductal regions. Saline contrast echocardiography should be done in suspected cardiac causes of cyanosis with apparently normal echocardiogram to detect occult right to left shunts. Management is directed towards the cause. In neonates with cyanosis and shock, PGE1 may be life saving till a definitive diagnosis is reached.*

Keywords: *Central cyanosis, Peripheral cyanosis, Congenital cyanotic heart diseases.*

Points to Remember

- ***Respiratory conditions are the most common cause of cyanosis in children.***
- ***Pulse oximetry screening can detect presence of clinically undetectable desaturation, hence CCHDs can be picked up early with this screening.***
- ***Clinical history, astute examination, chest radiograph, and ECG provide maximum clue towards the broad subset of CCHD, aiding the management before an echocardiogram can be done.***
- ***Surgical intervention (single or staged) is the mainstay of management of CCHDs. Timing of intervention depends on the specific lesion.***

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CARDIOLOGY - I

EVALUATION OF SYNCOPE IN CHILDREN

*Sweta Mohanty

Abstract: *Syncope is a common pediatric complaint, with the commonest cause being benign neurally mediated syncope. However, in some cases, it can be the harbinger of serious, underlying cardiac disease. A baseline ECG is diagnostic in many cardiac conditions. When concerning factors are present on history, such as syncope with exercise, coexisting palpitations, or family history of sudden cardiac death, further cardiac evaluation should be performed. This article covers the evaluation and management of syncope in children, with emphasis on factors in the history and baseline investigations.*

Keywords: *Pediatric syncope, Exercise, Channelopathy.*

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Points to Remember

- ***The most common cause of syncope is reflex vasovagal.***
- ***The cardiovascular causes of syncope are arrhythmias, primary cardiac anomalies and coronary abnormalities.***
- ***Baseline ECG should be done in all cases of pediatric syncope.***
- ***As heart rate can affect QT interval, calculation of QTc is essential.***
- ***Factors suggestive of cardiac cause include syncope with exercise, lack of prodrome, associated chest pain or palpitations, syncope occurring in supine position, family history of sudden death, or abnormal cardiac examination.***
- ***Detailed evaluation by a pediatric cardiologist is necessary in the presence of concerning factors in history or on examination.***
- ***The extent of testing is individualized, and may include exercise stress test or Holter monitoring.***

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CARDIOLOGY - I

TACHYARRHYTHMIAS

Saileela Rajan

Abstract: *Tachyarrhythmias in children are not uncommon, and often present as an emergency. A high index of suspicion is required to diagnose tachyarrhythmias in infants as the symptoms are often vague and non-specific. This article discusses the frequently encountered tachyarrhythmias in children, practical approach to their diagnosis and outlines the management options.*

Keywords: *Tachyarrhythmia, Supraventricular tachycardia, Atrial flutter, Adenosine, Cardioversion.*

Points to Remember

- ***A systematic approach to ECG helps to diagnose the mechanism of arrhythmia.***
- ***A 12 lead ECG should be documented initially when the child presents with tachyarrhythmia. An ECG (rhythm strip) should be documented during administration of adenosine. Another 12-lead ECG should be recorded after the rhythm reverts to sinus.***
- ***EAT and PJRT are incessant tachycardias and can lead to tachycardia induced cardiomyopathy. Cardiac function improves on treatment of the arrhythmia.***
- ***Catheter based radiofrequency ablation provides cure to many forms of recurrent arrhythmias.***

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CARDIOLOGY - I

KAWASAKI DISEASE IN CHILDREN - AN UPDATE

*Saji Philip

Abstract: *Kawasaki disease (KD) is a systemic vasculitis of unknown origin, in which circulating immune complexes triggered by infectious or non-infectious agents have been detected in the early phase, implicating that immune-pathologic mechanisms might be involved in the pathogenesis of vasculitis in KD. KD should always be considered in children with prolonged unexplained fever, thrombocytosis and skin peeling. The first line of treatment includes IVIG and aspirin. Infliximab or second dose of IVIG plus low-dose prednisolone are reasonable choices of treatment for patients with refractory KD. Giant aneurysms seldom resolve and need lifelong antiplatelet and anticoagulant therapy. Timely diagnosis and an effective risk-stratified treatment regimen, specially infliximab can reduce the incidence of coronary artery abnormalities and lead to faster resolution of large aneurysms. Long term follow up and parental counselling is most essential and crucial in KD coronary artery disease.*

Keywords: *Kawasaki disease, Intravenous immunoglobulin, Cornary artery disease, Infliximab, Pathogenesis, Thrombocytosis, Refratory Kawasaki disease.*

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Points to Remember

- ***Kawasaki disease is a systemic vasculitis of unknown origin and circulating immune complexes triggered by infectious or non-infectious agents which have been detected in the early phase of KD.***
- ***KD should always be considered in children with prolonged unexplained fever, thrombocytosis and peeling of skin supported by AHA special criteria.***
- ***The role of the coronary Z scores has become increasingly crucial for management and follow-up of CAL.***
- ***Gold standard therapy for acute phase of KD is IVIG and aspirin, but add on therapy will certainly mitigate the severity of coronary artery vasculitis.***
- ***Infliximab or second dose of IVIG plus low-dose prednisolone are both reasonable choices of treatment for patients with refractory KD. Giant aneurysm seldom resolves and needs lifelong antiplatelet and anticoagulant therapy.***
- ***Timely diagnosis and an effective risk-stratified treatment regimen can reduce the incidence of coronary artery abnormalities.***
- ***Long term follow up and parentalcounselling are most essential and crucial in KD with coronary artery disease.***

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GENERAL ARTICLE

ADENOVIRAL INFECTIONS IN IMMUNOCOMPETENT CHILDREN

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Abstract: *Human adenoviruses are notorious to cause infective outbreaks among young, otherwise healthy children. The clinical features are variable and may not be localised only to the respiratory system. Adenoviral infections can present as influenza-like illnesses and can pose diagnostic and therapeutic dilemmas for clinicians, especially if there are other concurrent viral outbreaks. The clinical, laboratory, and radiological features are quite non-specific and can lead to injudicious antibiotic use, especially in the presence of elevated inflammatory markers such as C-Reactive Protein and procalcitonin. This narrative review describes the clinical, and laboratory profile and the potential treatment options in adenoviral illness in immunocompetent children. We also suggest a clinical management algorithm that can be used for an immunocompetent child presenting with influenza-like illness.*

Keywords: *Pharyngoconjunctival fever, Epidemic keratoconjunctivitis, Intravenous immunoglobulins, Cidofovir, Influenza-like illness, Corticosteroids, Immunocompetent.*

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Points to Remember

- ***Human adenovirus infections can manifest with a wide spectrum of clinical manifestations and cause high levels of inflammatory markers, even in the absence of concurrent/secondary bacterial infection.***
- ***During an outbreak, the treating clinicians must have a low threshold of suspicion of this viral illness to avoid the unnecessary use of antibiotics.***
- ***Majority of the immunocompetent children with adenoviral infections can be managed with symptomatic treatment.***
- ***Antivirals and immune modulators may be used in the critically ill on a case-by-case basis.***

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DRUG PROFILE

USE OF MUCOACTIVE MEDICATIONS IN CHILDREN

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Abstract: *Bronchiolitis, cystic fibrosis, bronchiectasis, primary ciliary dyskinesia, pneumonia, and severe asthma are some conditions that cause accumulation of thick mucus secretions in the respiratory tract. The mucolytic medications lyse these thick secretions and thereby increase clearance of the airways and are used with varying degrees of success.*

Keywords: *Mucoactive medications, Mucolytics, Cystic fibrosis, Hypertonic saline, Dornase alfa, Carbocysteine, Inhaled surfactant, Airway diseases.*

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Points to Remember

- ***Mucoactive agents are mucolytics, expectorants, mucokinetics and mucoregulatory medications.***
- ***Mucoactive drugs are indicated mainly in bronchiectasis, bronchiolitis, severe asthma and cystic fibrosis.***
- ***Dornase alfa is clinically beneficial in CF bronchiectasis but harmful in non-CF bronchiectasis with worsening of exacerbations.***
- ***Mucoregulatory medications such as ivacaftor, lumacaftor and tezacaftor are FDA approved for use in patients with cystic fibrosis and should be taken with fat containing food.***

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CASE REPORT

SEVOFLURANE IN TREATMENT OF REFRACTORY LIFE THREATENING ASTHMA

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Abstract: *Asthma is a common disease in children, caused by chronic inflammation of airways, leading to reversible airflow obstruction and enhanced bronchial reactivity. Status asthmaticus is treated with nebulisations, intravenous bronchodilators. When these interventions fail, the option of inhaled anaesthetic agents can be considered, amongst which sevoflurane is one of the safest. Inhaled anaesthetics are associated with risk of developing malignant hyperthermia.*

Keywords: *Refractory status asthamaticus, Sevoflurane, Malignant hyperthermia.*

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